REMARKS

This Amendment is filed in response to the Office Action filed on May 2, 2007, along with a request for a three month extension of time and appropriate fees. All objections and rejections are respectfully traversed.

Claims 1-8 are in this case.

Claims 1 and 5 have been amended to better claim the invention.

Claims 7-8 have been added to better claim the invention.

OBJECTIONS TO DRAWINGS

At paragraph 1 of the Office Action, the Examiner objected to figures 4A, 4B, 5, and 7 because these drawings did not show legends explaining the reference numerals used in the figures. The drawings have been amended and are believed to be in acceptable condition.

At paragraph 2 of the Office Action, the drawings were objected to under 37 C.F.R. 1.83(a) for not showing every feature of the invention specified in the claims. A new drawing, Fig. 5B, has been filed. Support for Fig. 5B is found on page 10, lines 12-30, of the specification. No new matter has been introduced. The drawings have been corrected and the proper Replacement sheets are being filed concurrently with this Amendment.

REJECTION UNDER 35 U.S.C §112, FIRST PARAGRAPH

At paragraphs 4-5 of the Office Action, claims 1 and 5 were rejected under 35 U.S.C. §112, first paragraph, for failing to comply with the written description requirement. Claims 1 and 5 have been amended and are believed to overcome this rejection.

REJECTION UNDER 35 U.S.C. §112, SECOND PARAGRAPH

At paragraphs 6-7 of the Office Action, claim 5 was rejected under 35 U.S.C. §112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 5 has been amended and is believed to overcome this rejection.

REJECTION UNDER 35 U.S.C §103(a)

At paragraphs 8-9 of the Office Action, claims 1, 3-6 were rejected under 35 U.S.C. §103(a) as being unpatentable over Caceres *et al.* U.S. Patent No. 6,167,133 issued on December 26, 2000 (hereinafter "Caceres"), in view of LeBlanc U.S. Patent Publication No. 2002/0101830 published on August 1, 2002 (hereinafter "LeBlanc").

Claim 1, as amended, recites:

1. A method of performing echo suppression in a telecommunications system, the method comprising:

    (A)   calculating at least one value representing energy in a plurality of pulse code modulated (PCM) samples of an input speech signal;

    (B)   ***building a synthetic echo envelope from said values;***

    (C)   aggregating said values for the at least one sample over a period of time to form a frame of an aggregate energy value for that period of time;

    (D)   solving a plurality of normal equations for said aggregated values, the plurality of normal equations having a plurality of results;

    (E)   examining the results to determine a peak aggregate result, the peak aggregate indicating a time delay and a gain of an echo path; and

    (F)   evaluating each incoming PCM sample against a corresponding output energy result obtained at a determined time delay, and if an input speech energy is determined to be less than a historical output energy scaled by a determined gain, then suppressing echo from the input speech signal.

Caceres teaches a method for processing telecommunication signals to alleviate echo during a voice communication between a local talker and a remote talker that relies upon the application of circular buffers for near and far end signals to preserve processing time. In Caceres, a voice activity detector detects streams from a near end talker and a far end talker, which is further away. Based on the stream collected by the voice activity detector, the system determines when there is an echo. When there is a high degree of coherence between the outgoing speech and the incoming speech and when the magnitude of the reflected speech is large enough in comparison with the outgoing speech, there is likely an echo. Specifically, the location of the echo is determined by a delay calculation methodology that finds the maximum of the average magnitude of coherence as a function of time delay between the outgoing and incoming channels. Additionally a tracker algorithm is used to assure that the estimate of the echo location is relatively consistent and not subject to spurious estimates and outliers in the data. Furthermore, this process assesses each voice signal sample by sample for an echo.

LeBlanc teaches a system and method for providing a stable gain from an adaptive gain control device in a signal path. An echo canceller is also located in the signal path, and is used to provide performance information regarding losses in the signal. Furthermore, LeBlanc teaches a physical device (PXD), which provides two-way communication with a telephone, or a circuit-switched network, such as a PSTN line carrying a 64 kb/s pulse code modulated (PCM) signal. An echo canceller is used to remove echoes from far end speech present on the incoming PCM signal before rerouting the incoming PCM signal back to the far end user.

Applicant respectfully urges that neither Caceres nor LeBlanc show a ***building a synthetic echo envelope from said values.***

The Applicant's claimed invention is directed to an echo <u>suppression</u> technique by using energies that are already calculated to build a synthetic echo envelope. Specifically, the synthetic echo envelope is used to determine the delay and the gain of the echo signal whereby a determination can be made as to whether a signal is an echo or true input speech. Even more specifically, the energy data for the samples over a period of time

are aggregated to form the aggregate energy value for that period of time. The results are calculated using the aggregate energy values contained in the synthetic echo envelope. Subsequently, the peak aggregate result is identified and evaluated by comparing the incoming samples against the corresponding output energy result obtained at a predetermined time delay, and if the input speech energy is determined to be less than a historical output energy scaled by a determined gain, then the signal is classified as echo and is suppressed from the input speech signal.

Neither Caceres nor LeBlanc disclose the use of a synthetic echo envelope built from energies already calculated by previously evaluated PCM samples. Caceres discloses suppressing the echo by first predicting *an echo, **but does not disclose or suggest the use of a synthetic echo envelope**.* In the present invention, instead of calculating the resulting peaks using the individual PCM samples (i.e., like Caceres) the present invention uses energy values that are already calculated to build a synthetic echo envelope and then evaluates whether an echo is present by using the peak aggregated result. Specifically, in Caceres "these computations are performed for each new near end frame and each new far end frame" (col. 6. lines 2-20). This calculation process is performed repetitively and assesses each voice signal on an individual basis. This is what the present invention was designed to avoid. The present invention instead uses one peak result from a synthetic echo envelope, determined from past calculated samples, to determine whether there is in fact an echo present. In this regard, LeBlanc adds nothing to Caceres.

Applicant respectfully urges that Caceres and LeBlanc, either taken singly or in combination, are legally insufficient to render the presently claimed invention obvious under 35 U.S.C §103(a) because of the absence in each of the cited patents of Applicant's claimed novel ***building a synthetic echo envelope from said values.***

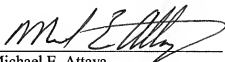All independent claims are believed to be in condition for allowance.

All dependent claims are believed to be dependent from allowable independent claims, and therefore in condition for allowance.

Favorable action is respectfully solicited.

Please charge any additional fee occasioned by this paper to our Deposit Account
No. 03-1237.

Respectfully submitted,

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